2 Sheets—Sheet 1.

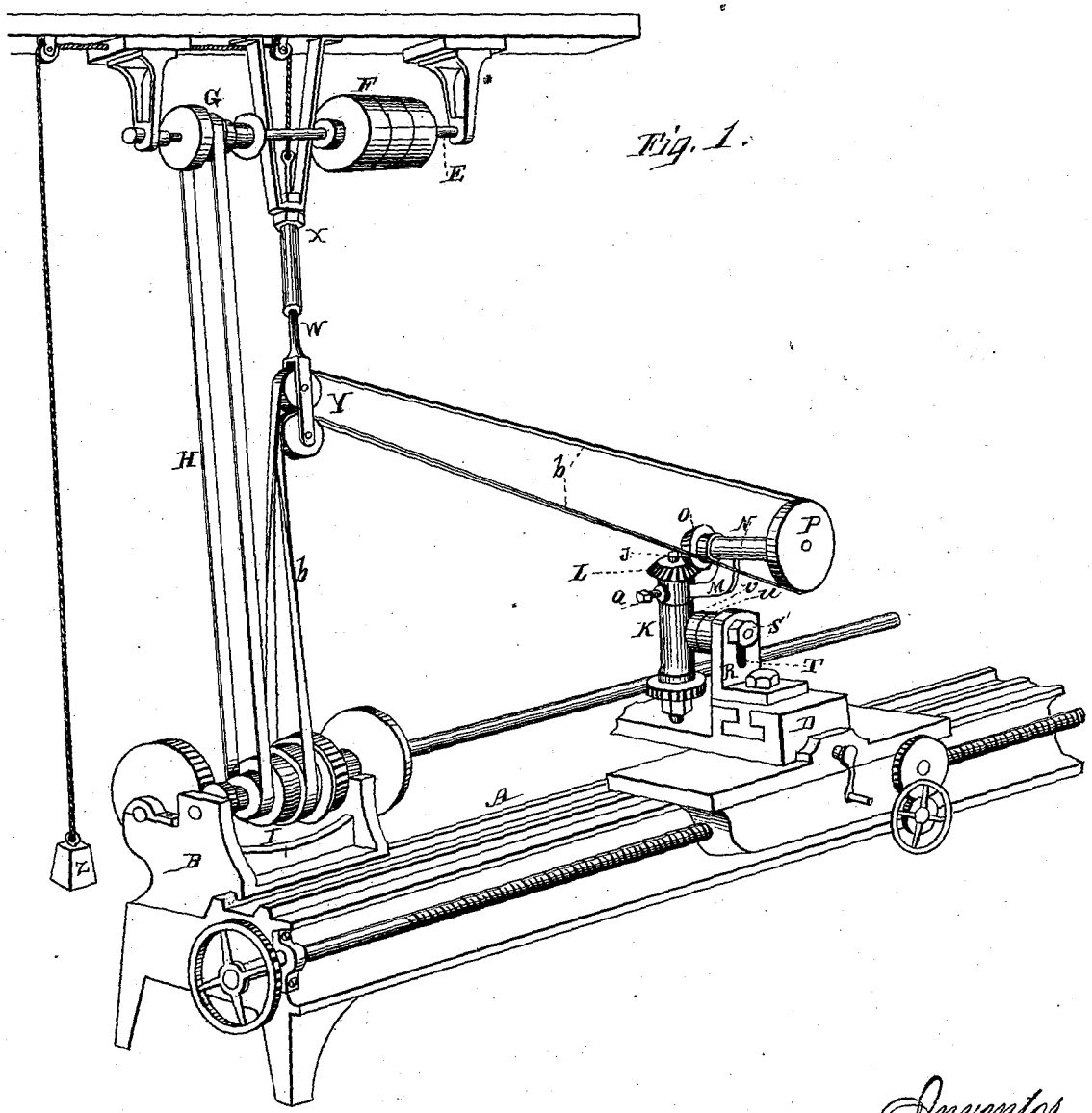
(No Model.)

H. RICHMANN.

LATHE ATTACHMENT.

No. 253,314. Patented Feb. 7, 1882.

Fig. 1.



Witnesses,
Geo. H. Strong.
Frank A. Brooks

Inventor,
Henry Richmann
By Dewey & Co.
Attys

(No Model.) 2 Sheets—Sheet 2.

H. RICHMANN.

LATHE ATTACHMENT.

No. 253,314. Patented Feb. 7, 1882.

Fig. 2.

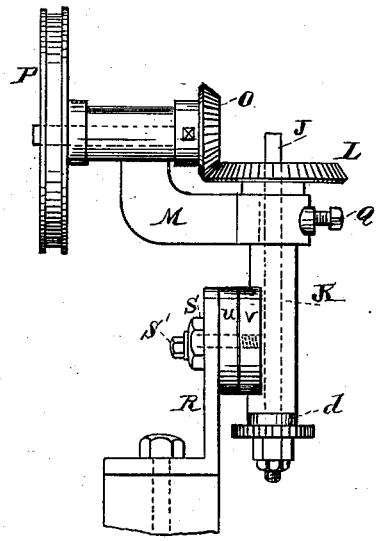


Fig. 3

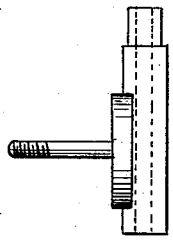


Fig. 4.

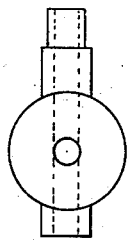


Fig. 5.

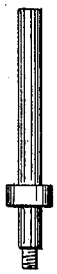


Fig. 6.

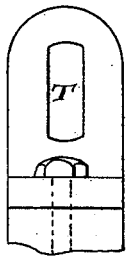


Fig. 7.

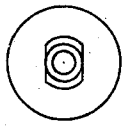


Fig. 8

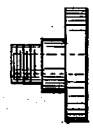
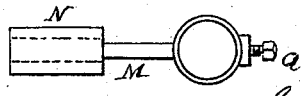


Fig. 9



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Henry Richmann
By Dewey & Co.
Attys

UNITED STATES PATENT OFFICE.

HENRY RICHMANN, OF SAN FRANCISCO, CALIFORNIA.

LATHE ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 253,314, dated February 7, 1882.

Application filed February 8, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY RICHMANN, of the city and county of San Francisco, State of California, have invented a Lathe Attachment; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a novel attachment for lathes, which is adapted to cut the teeth of gear-wheels, ratchet-teeth, spiral grooves for twist-drills, key seats or ways in shafts, bolt-heads, nuts, and various kinds of irregular work which ordinarily requires special and complicated apparatus.

It consists of a support which has a foot that may be clamped to the tool-rest of the lathe. This support is slotted to receive a bolt which holds an adjustable standard, through which the spindle passes which drives the various cutting-tools that are secured to it. This spindle is driven by gearing or pulley, or both. The belt from the pulley passes up over two pulleys, which are vertically adjustable, to allow the tool to move longitudinally upon the lathe-bed, and thence down to the main pulley in the head-block of the lathe, a counterbalance keeping up the tension.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 shows a lathe with my attachment. Fig. 2 is a side view of the attachment. Figs. 3, 4, 5, 6, 7, 8, and 9 are detailed views of the parts.

A is a lathe-bed. B is the head-block, the tail-block not being shown, and D the tool-rest, of a lathe. E is the counter-shaft, usually turning in boxes supported in hangers depending from the ceiling, and carrying the driving-pulleys F and the cone-pulleys G, from which a belt, H, passes around similar pulleys, I, on the head-block of the lathe, these parts being in the usual construction of lathes.

My device consists of a driving-spindle, J, the lower end of which is fitted to receive and hold any form of cutter which it may be desired to use, such as are used in milling-machines and gear-cutters. This spindle is supported and turns in a sleeve or standard, K, and has a bevel-gear wheel, L, at its upper end. A swivel-arm, M, projects from this standard, and has a box, N, which supports a shaft at right angles with the tool-spindle. A bevel-gear, O, upon this shaft meshes with the gear-wheel L, to drive the tool-holder, and a pulley, P, upon its opposite end receives a driving-belt, which operates as will be hereinafter described.

The arm M may be swiveled or turned around the tool-spindle as a center, so that the latter may be set at any desired point or angle with reference to the position of the driving-pulley, and it is fixed by a set-screw, Q. The angle at which the tool-spindle works is determined by fixing its standard to a permanent standard or support, R, by a nut and screw-bolt, S′, which passes through a slot, T, in the support R. This support is firmly secured to the tool-rest. Disks *u v* lie between the support R and the standard, and when the nut S is loosened the standard, with its spindle, may be elevated or depressed through the slot, or it may be turned about the bolt as a center without altering its position vertically by loosening the nut S′. This independent movement is accomplished by forming the outer disk, *u*, with a projection which will fit the slot T without turning in it, while the continuation of said disk, which receives the nut S, is large enough to just pass through the slot. A hole is bored through this and the disk *u*, and a bolt from the disk *v* passes out through this hole and receives the nut S′. By this construction either adjustment may be made without disturbing the other.

In order to drive this mechanism, and at the same time allow it to be moved longitudinally upon the lathe-bed without altering the tension of the driving-belt, I have shown an adjusting device consisting of a sliding bar, W, moving up and down through a guide or bracket, X, and having the pulley Y at its lower end. The upper end is connected with a rope passing over pulleys, and having a counter weight or spring, Z, at its opposite end. The belt *b* passes over the cone-pulley in the head-block of the lathe, and thence over the pulleys Y and down to the pulley P. By this construction it will be seen that the apparatus may be moved along the lathe-bed with the tool-rest, the sliding bar and counter-balance keeping a proper tension upon the belt.

The gear-wheels L and O may be transposed to change the speed, or both may be removed and a pulley secured directly to the head of

the tool-carrier for some classes of work. Key-seats may be cut of any desired length, depth, and width in shafts. Bolt-heads and nuts of any shape may be formed. Spiral grooves of any pitch may be cut in rods of steel for twist-drills or other purposes. Gear-teeth may be cut. Milling-tools of all descriptions or emery-wheels may be attached and worked, this attachment serving all the purposes of the most expensive milling-machine.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the tool-spindle J, with its bevel-gear wheel L turning in the sleeve or box K, which is supported and adjusted upon a fixed standard, R, as shown, the swivel-arm M, turning loosely about the sleeve K and having the set-screw Q, said arm supporting the shaft carrying the bevel-gear O and pulley P at right angles with the tool-spindle, so that it may be fixed at any point radially around the tool-spindle, substantially as and for the purpose herein described.

2. The fixed standard R, slotted at T, and the sleeve K, within which the tool-spindle J revolves, as shown, in combination with the disk *u*, having a projection or lug to fit the slot T and a threaded portion to receive the nut S, and the disk *v*, having a bolt passing through the disk *u* and its projection, and threaded to receive the nut S′, whereby a vertical adjustment or an angular adjustment about the bolt as a center may be made, substantially as herein described.

3. In combination with a lathe having the driving-pulley I, and the supplemental tool-carrying spindle J, turning in the sleeve K, which is supported and adjusted upon a standard, R, fixed to the movable rest D, the sliding tension-bar W, with the counter-balance Z, the pulleys Y, the pulley P, and the belt *b*, all combined and operating substantially as herein described.

In witness whereof I have hereunto set my hand.

HENRY RICHMANN.

Witnesses:

GEO. H. STRONG,

S. H. NOURSE.